

# Political and planning interventions in urban mobility : weighing local context in the transferability of local solutions

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**ABSTRACT:** In many cities all over the world Urban Public Transport (UPT) has not been able to deliver the desired contribution towards sustainable mobility, in its three dimensions: environmental, economic and social. The two first dimensions mostly have to do with the competition with land use, the private car and the reduction of congestion, whereas the latter has to do with ensuring social cohesion by delivering mobility services that adequately cover the activity spaces and times of large segments of the population at prices that do not exclude those with lower economic means. Moreover, all of this should be made without excessive recourse to the taxpayers' contribution, without which the very stability of supply periodically comes into question. A considerable number of experiments, both at tactical (planning) and operational levels, have been attempted to improve public transport performance, but mostly with only relative or no success in those fronts. An important part of the difficulty stems from the fact that the service requirements of the various population segments are rather different and most attempts have been trying to solve the problem with a single type of service. Deeper analysis allows the understanding that handling urban mobility problems requires an enlarged perspective of the problem that goes far beyond the provision of public transport and should entail all services, infrastructure and traffic management that jointly enable citizens to satisfy their mobility requirements. The complexity and diversity of dimensions of the conurbation and agents involved in an urban mobility system imply focusing the analysis of its performance on the symbiotic relationship between its main components. Quality factors and processes should be set up in a coherent organizational framework, providing adequate interaction mechanisms for policies and intervening institutions covering the three levels of decision – strategic, tactical and operational, encompassed in a holistic approach to urban mobility management. This paper will confront the application of the same principles and management model to two distinct realities, Brazil and Portugal, reflecting an experience that goes from the development of organizational and regulatory frameworks for urban mobility systems down to the production of an operational mobility plan, ensuring consistency between strategic objectives and operational outcomes, and dealing with partially conflicting objectives and several types of other constraints. The cases presented provide evidence that UPT, when assessed in an isolated perspective, represents a problem with limited success perspectives in many cities, but represents a key element to achieve a good overall solution when the holistic perspective of urban mobility systems is adopted.

## 1 INTRODUCTION

Despite the general awareness all over the world of the importance of the sustainability concept for urban mobility policies the fact is that for most cities this is still an illusion and the many measures devised to contain the main sustainability threats – congestion and lack of decisions on long term choices for the evolution of systems – have never achieved the desired success.

Much research has been done at international and national levels and a considerable number of experiments, both at tactical (planning) and operational

levels, have been carried out to improve public transport performance in order to improve sustainability of urban living, but most experiments had only relative or no success when confronted with the holistic goals behind the sustainability concept. However some consolidated evidences have emerged all over the world, such as: the understanding that an important part of the problem stems from the fact that the service requirements of the various population segments are rather different and most attempts have been trying to solve the problem with a single type of service for an average client that possibly does not exist; the understanding that handling urban mobility problems requires an enlarged perspective of the problem that goes far beyond the provision of

public transport and should entail all services, infrastructure and traffic management that jointly enable citizens to satisfy their mobility requirements, preferably through well articulated chains of trips; the understanding that looking at public transport in an isolated way reduces it to the negative perspective of a business with poor economic feasibility and a weak competitor for public finance, facing other public interest services that serve a wide majority of the population with similar needs (e.g: education, health, etc), while, at the opposite, if encompassed in a systemic approach to urban mobility public transport plays a key role in the good performance of the all system.

The departure point of this work is thus managing urban mobility in an integrated way, covering all modes and infrastructure thus enabling all sorts of displacements in an urban environment. Mobility is assumed as an attribute of the city and one of its main competitive factors.

## 2 INTEGRATED MANAGEMENT OF URBAN MOBILITY SYSTEMS

The complexity and diversity of dimensions of the conurbation and agents involved in an urban mobility system imply focusing the analysis of its performance on the symbiotic relationship between its main components.

Quality factors and processes should be set up in a coherent organizational framework, providing adequate interaction mechanisms for policies and intervening institutions covering the three levels of decision – strategic, tactical and operational, encompassed in a holistic approach to urban mobility management as defined in (Macário, 2005).

Each of these decision levels has a specific mission within the system: the strategic level is responsible for the mobility policy, it is where objectives and means are defined reflecting the needs and aspirations of the citizens. The corresponding decision process should be performed by political entities; the tactical level, where the mobility system is conceived and the respective components are defined translating the strategic goals into operational specifications, assuring the effectiveness and coherence of the system. Depending on several parameters the functions that this level entails can be performed by different public or private agents and contracts can also be allocated through competitive procedures; the operational level, where transport services are produced and consumed and infrastructures are used.

Depending on the regulatory option, public transport services can be performed directly by the transport authority, in which case it accumulates also the design of the system, or contracted out to an operator (private or public) by direct negotiation or through a tendering procedure. It is worth underlining that the individual self-production modes (walking, bicycles, private cars) and all the infrastructures are also a component of the mobility system.

However, in the real world the division into these three levels is not so “clear-cut” as described above. For most cities (urban areas or conurbations served by the same transport system) their boundaries are very often fuzzy and the overlap between the strategic and tactical levels is common, with less clear (or even non-existent) strategic options made.

In addition, a consistency gap is often found in different interacting boundaries of the sub-systems. This gap arises either between the definition of strategic options and the tactical formulation to achieve those ends, or between this set of strategic objectives and the monitoring system of operations that should provide feedback for path adjustment, together with the good reading of the stakeholders needs, or still between the tactical formulations and the monitoring system.

In fact the gap results from an underperformance in the process that consists of “perceiving the problem - conceiving the solution - designing the policy package - implementing the measures – continuously monitoring – adjusting policy” and corresponding packages of measures, and restarting this process repeatedly.

Bridging these gaps means gaining consistency between stakeholders needs, strategic objectives of the mobility system (defining what to achieve), tactical formulations (how to achieve it) and monitoring processes and outcomes (how have we performed and what do we need to adjust).

The lack of a clear and well-structured regulatory and organizational framework is a key factor that may hinder the successful definition and implementation of a coherent mobility system, in particular if an effective interaction between the different parts of the system is not properly assured through a sound institutional configuration.

## 3 TRANSFERABILITY: CONCEPT AND PROCESS

In the real world what we observe<sup>1</sup> is the implementation of measures usually imported from elsewhere where they were part of a successful case, often without careful assessment of whether transferability conditions are ensured.

Transferability, in our work was defined as the ability to transfer/adopt in a given city successful measures previously adopted elsewhere, and achieve comparable results (Macário and Marques, 2004). Conditions of transferability are herewith understood as conditions of applicability or context variables.

Our transferability experience was threefold: first, the assemblage of the method itself using as a pilot experience the CIVITAS cities, having the leader and the follower city, studying the measures to be transferred between them and cross referencing the situation of the follower with the one of the leader, taken as a reference practice; secondly, the use of the method to apply the principles of the integrated urban mobility management approach already referred above, to the metropolitan areas of Lisbon and Porto; and, finally to transfer these principles and practices to the reform of urban mobility systems in Brazil, entailing its rather diverse 27 states.

Performing a transferability exercise is not at all a deterministic exercise. It requires the discipline to follow a suitable methodology and access to suitable information for the measure being implemented and, not less important, wise judgment on its overall goodness of fit to the particular situation at hand.

At the outset a detailed identification of the characteristics of the urban structure in each city has to be taken into account for the implementation of the transferability approach encompassing aspects such as geographic, structural, demographic, architectural, and cultural, departing from cluster schemes developed in previous research projects that create urban typologies.

Cluster analysis may be defined as "a variety of procedures that can be used to create a classification. These procedures empirically form "clusters" or groups of highly similar entities." (Aldenderfer and Blashfield, 1984). In other words we use cluster analysis to define groups of cases, through a number of mobility planning and management procedures, which are more similar between the cities in a cluster than between these and others.

In the particular situation of CIVITAS, however, this exercise (still on-going, in the data collection stage) is driven by the type of characteristics enhancing the fitness of a specific measure and having special attention to the possible relationships between measures and their complexity, so avoiding more simple analysis of individual measures that disregard the effects of policy packages.

A major limitation found at the start of this exercise was the impossibility to ensure that cities within the same cluster would have conditions of comparability. In fact some measures may have the capacity to survive in several clusters although denoting a different response from city to city, even within the same cluster. We have seen that this phenomenon is more likely to occur whenever the variables driving the clusterization have poor correlation with the set of conditions that enhance success of a given measure.

## 5 ANALYSIS OF TRANSFERABILITY

These limitation led us to a deeper analysis of the conditions for applicability of measures within CIVITAS cities, which was done through a set of features that describe the functioning of the urban system that we have labeled as key aspects and indicators, being:

- **Urban characteristics:** surface, jobs, inhabitants, density and concentration (jobs and inhabitants), geographical shape of the city, commuting degree, growth (jobs and inhabitants)
- **Population characteristics:** average household size, percentage of highly educated inhabitants, age of inhabitants, number of jobs per inhabitant, number of jobs divided by the local labour force
- **Transport supply :** public transport : number of vehicle km, line length, number of stops, frequency, heavy and light rail supply, fares and revenues per vehicle km, number of place km per year individual transport, parking places, parking prices, length of individual transport network
- **Vehicle ownership:** number of cars per inhabitant, number of cars per household, bike ownership
- **Travel patterns:** number of trips made per person and per day, distance travelled per person and per day, time spent travelling per person and per day

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<sup>1</sup> The observation of cities was based on the case studies analysed in Brazil, Ireland, Australia, South Africa, USA and the ones developed in the following research projects of the 4<sup>th</sup> RTD framework of the European Commission: ISOTOPE, QUATTRO, PATS, FISCUS

- **Mode choice** : percentage of car trips in total trips, percentage of non motorised trips in total trips, percentage of public transport trips in total trips, percentage of car km of total km, non motorised modes km of total km, public transport km of total km, average car occupancy
- **Activity patterns**: percentage of trips made in peak hours, shopping and leisure trips
- **System impacts**: number of fatal traffic accidents per inhabitant per year, average speed of trips, average speed of cars, average speed of public transport, ratio public transport speed / car speed in the central city and in the local urban area
- the institutional design of the Transport Authorities limited their intervention to public transport instead of bridging the whole mobility system;

In Brazil, the reform (officially known as regulatory and organizational framework for urban mobility system) had a much wider and deeper scope of implementation. The objective set by the Federal Government, through the Ministry of Cities (Secretary of State of Urban Mobility and Transport - SeMob), was to make the harmonized application of the complete model, and associated concepts, to all the Cities, Conurbations and Metropolitan Regions with more than 100.000 inhabitants in the 27 Brazilian States. This represents 379 Municipalities plus 62 Urban Centers with a total population of 87.743.495 (as per 1998 Census), representing 55,85% of the total population of Brazil

For the transferability of principles, regulatory framework and system management approach, we have considered the following aspects:

- **Urban characteristics**: population in the metropolitan areas; physical area of the urban/metropolitan area; type of land occupancy; network length (for private and public transport);
- **Political commitment**: priority given to mobility issues in government programs and plans of action; degree of diverging views between government and opposition potentially threatening stability of the institutional arrangements; public awareness of mobility problems
- **Institutional complexity**: number and diversity of authorities and agents involved (with active and passive intervention) in the mobility system.

In both cases of Portugal and Brazil the design and implementation process was conceived to have a participatory process with discussion of the system management approach with the main stakeholders, that is the several agencies within the Ministry of Transport, with Transport Regulators, with Public Transport Operators, with Municipalities, with Trade Unions, and with Associations of Consumers. In Lisbon and Porto it was discussed with the two first groups and with Public Transport Operators only in Lisbon, the process having been interrupted by the change of Government.

Some major limitations were found in the experience with these two Portuguese cases. These were:

- Lack of a clear financial framework to support the activity of future Metropolitan Authorities and to enable the transformation of old public transport concessions into new contracts;

For the adjustment of the model to the Brazilian reality interviews were carried out with authorities and operators from 22 cities, 21 participatory discussion sessions were held with stakeholders, as well as 17 interviews with political key informants and with the main operators (fleets above 4.000 vehicles) serving more than one city and with some small operators (fleets around 200 vehicles). In addition, a questionnaire was launched in 95 cities, and the process of analysis of transferability of the new paradigm was accompanied by extensive consultation with stakeholders and realization of thematic seminars on the issues considered most sensitive, such as: regulatory and organizational options, financing urban mobility system and contracting and tendering for services and infrastructures.

In the preliminary consultation phase (April-June 2005) the proposed approach was discussed in the referred stakeholders sessions and in general obtained the confirmation of its adequacy for implementation in the different Brazilian cities. The following categories of stakeholder organizations were consulted: Transport Associations (authorities and operators); Regulatory Agency; Parliament; forum of Transport Secretaries of all States; Metropolitan Regions and respective Transport Secretaries; Associations of Municipalities; organized society through the Council of Cities; National Confederation of Transport; Associations of Producers of the Transport Industry; most relevant Federal Universities with Transport Studies (Brasilia, Recife, Natal, Rio de Janeiro, S. Paulo); Transport Research Associations.

It is worth highlighting that the Federal Government does not have any authority to force the implementation of the reform by the municipalities, who are the entities responsible for urban mobility. This means

that the reform is being implemented nationwide based on inducement.

The main difficulties found in the transferability of this systemic approach were due to the institutional configuration of the Brazilian Federation, where we have found some overlap of powers, namely between Metropolitan Regions and Municipalities. A particular difficulty is raised by the fact that the last revision of the Constitution gives to the Municipalities the statute of federal entities, ignoring the hierarchy between the four levels of government (Union, States, Regions and Municipalities). This creates a number of inconsistencies with previous laws made in the perspective of hierarchical levels of government, but so far there is no consensual solution on how to solve the problem.

These difficulties with institutional configuration were the main reason to design the implementation with a strong component of training and dissemination of information (in particular of good practices) since in Brazil there is a strong tradition of adopting change processes through training and education, sometimes even ignoring the need for legislation. A good example is the current calculation of operational costs of urban transport, used for setting public transport fares and also for payments to the operators in contracted services, which is adopted as if it was a legislation, when in fact it was implemented only through training and has never been legislated.

## 10. CONCLUSIONS

From the experiences referred (and still on-going in the case of the CIVITAS program) we have identified a sequence of analytical actions that should guide a transfer process of mobility policies and measures. These are:

- Diagnostic of the Problems
- Characterization of the City
- Analysis of the city context and implications of problems identified
- Look around for reference contexts
- Selecting examples of adequate sources as Urban contexts
- Identify measures /policies adopted in those sources with potential for transferring
- Packaging and dimensioning the measures for transfer
- Ex-ante assessment of measures to transfer
- Identify need for adjustment
- Implement measures/policies and steer results

These guidelines can not be considered as final since they are still being tested with all the cities involved in the CIVITAS program, however the experiences

reported in this paper provide already valuable inputs to consolidate a transferability method applied to urban mobility systems

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